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ABSTRACT

Since the 1890s, researchers have been studying the impact of teachers' characteristics and styles on their students' progress. Many attempts to quantify basis of quality teaching have been made. The research into teaching styles has traveled through four distinct phases. The first was concerned with describing the characteristics of the effective teacher, although there was not any attempt to determine whether the identified teacher qualities were actually correlated with student learning outcomes. A second phase was a series of studies into the various methodologies of teaching. These studies led to the investigation of process-product processes, as displayed in the development of teacher assessment instruments. Researchers are currently trying to identify the interpersonal teaching styles of teachers and to determine their effects on student cognitive and affective outcomes. Research has not yet addressed the effect of interpersonal teaching behavior and student cognitive outcomes at the six taxonomic levels of cognition developed by B. Bloom. Research to investigate the correlations and the significance of any correlations among students responses to the Questionnaire on Teacher Interaction, achievement test scores, and cognitive outcomes is proposed. (Contains 50 references.) (SLD)

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A Review of the Research into Teaching Styles/Behaviors' Impact on Students' Cognitive Outcomes and Bloom's Taxonomy.

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Presented at the Annual Meetings of the SERA
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Introduction

Since the 1890's, researchers have been investigating the impact of teachers' 3characteristics and styles on their pupils' progress. There has been a recognized need to understand the basis for quality teaching in the 9-12 grade education setting. Quality teaching style is operationally defined as those actions, interactions and communications of the teacher with her/his students which are associated with positive cognitive and/or affective student outcomes. There have been numerous attempts to quantify the basis for quality teaching in the last 100 years. The first attempts were descriptive in nature and these studies were conducted to ascertain the characteristics of the effective teacher (see Barr & Emans, 1930; Charter & Waples, 1929; Hart, 1934; Kratz, 1896). None of these studies attempted to ascertain if the identified descriptors were associated with students learning outcomes either cognitively or affectively. The next series of investigations were identifiable by a number of key correlational studies with the central question of, is there a correlation or association between certain teacher behaviors and students' cognitive or affective learning outcomes or both (see Bennett, 1976; Brophy, 1973; Flanders, 1960, 1964, 1965, 1970 1970a; Good, Biddle and Bropy 1975; Haige and Schmidt, 1956; Medley, 1977, 1979; Ostland, 1956; Rosenshine, 1970; Stalling 1976; Soar, 1968; Veldman and Brophy, 1974; Wispe, 1951)? The Flanders, Soar and Tuckman models proposed a positive correlation between indirect teaching styles and cognitive achievement . While the Bennett model proposed a positive correlation between direct teaching styles and cognitive achievement at the lower levels of complexity. A positive correlation between

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democratic teaching methods and cognitive and affective achievements were also proposed by Anderson in his 1959 review of the literature.

Anderson's (1959) review of the research proposed that the teaching styles were arranged on a continuum from authoritarian on one end to democratic to laissaz faire on the other end. The Soar model (1968) utilized a continuum with direct and indirect teaching styles on the extremes and a mixed style in the middle. The Soar model also proposed that the relationship between teaching styles and student outcomes would be curvilinear for the lower cognitive levels and linear for the upper cognitive levels. The Bennett (1976) model was a noncontinuous model with various teaching typologies ranging from completely indirect to completely direct with other discrete categories between the extremes. In the Flanders (1960) model the teaching styles are determined by a numerical score that originates from a series of observations by trained observers. The Flanders Interaction Analysis Categories (FIAC) system identifies the teacher as indirect if the indirect score to direct score ratio was more than one. If it was less than one the teacher was identified as a direct style teacher.

In the Tuckman model the teaching styles were determined by observation but the observation was by the teachers' students. The scale used in the Tuckman model was continuous from a score of 1 to 9. With a score of 1 the teacher was identified as completely direct and a score of 9 as completely indirect.

This stage of the research was concerned with the development of teacher competencies and the proper utilization of those competencies. According to Medley (1979),"The effect of schooling on the individual depends to a considerable extent on

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who his teacher is" (p. 11). Medley (1979) also asserted that there were only two ways to improve the effectiveness of teacher.

> There are two important ways to improve the effectiveness of teachers. One is by improving the ways teachers are evaluated, and the other is by changing the way teachers are educated. Either type of change can result in improvement only if it is based on accurate information in the behavior patterns of more and less effective teachers, and the only reliable source of such information is sound research. (p. 11).

The current phase of this continuing investigation is the correlational studies between teachers' interpersonal communication teaching styles and the students cognitive and affective outcomes (see Brekelmans, 1990; Tuckman, 1980; Fisher, 1995; Henderson, Fisher and Fraser, 1995; Wubbels, Brekelmans and Hooymayers, 1991; Wubbels, Creton and Holvast, 1988; Wubbels, Creton and Hooymayer, 1985, 1987; Wubbels, Brekelmans, Creton and Hooymayers, 1989; Wubbels, Creton, Levy and Hooymayers, 1993; Wubbels and Levy 1989). The vital difference between the first and second and the third phases is that in the first and second phases the teacher was seen as a collection of competencies, techniques, and/or traits. But in the third phase the teacher is viewed as an integrated whole educator interacting with the students in his/her classes and his/her interpersonal communication teaching style is seen as instrumental in effecting the student's' cognitive and affective learning outcomes.

The investigations in the third phase are predicated on two communication theories Leary's (1957) and Watzlawick, Beavin & Jackson (1967). Leary's text

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Interpersonal Diagnosis of Personality was developed in the 1950's and became the basis for treatment of various psychological infirmities. Watzlawick et al adapted Leary's theory in the 1960's and this adaptation became and continues to be the basis for family and group counseling and therapies. In the 1980's Wubbels, Creton and Hooymayers utilized Leary's theory as modified by Watzlawick et al human communication theory as the basis for their model on interpersonal teaching behavior from which they constructed the Questionnaire on Teacher Interaction (QTI).

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Personality Traits, Professional Knowledge and Their Impact on Effective Teaching

Kratz (1894) investigated the hypothesis that there were identifiable personality traits associated with the effective teacher. The basis of the Kratz study was to identify the traits that the students believed were important for an effective teacher to possess. This was a departure of the prevailing preference for expert determination of teaching characteristics. According to Kratz, "There have been numerous pedagogical works written in which the characteristics of the best, or model, teacher have been set forth, but usually from the standpoint of some eminent educator" (p. 413).

Kratz (1894) utilized the input of the students in identifying the characteristics of an effective teacher. The first characteristic of an effective teacher was identified as the ability to be helpful in the students' studies. This lead Kratz to the conclusion, "A careful study of these replies suggests the thought that pupils are generally more appreciative of the earnest, intelligent efforts of their teachers to train and develop them..." (p. 415). The second item identified by the students was the ability to dress as a professional. According to Kratz, " That children are highly susceptible to such impressions of taste and neatness, and that they quickly imitate and improve under such influences, is well known and constantly utilized..." (p. 416). The third identified characteristic was the ability of the teacher to be good and kind to the student. Kratz revealed that the small acts of attention or kindness from the teacher to her pupil or pupils were extremely influential in the pupils developing an affection and respect for their teacher. The other characteristic that the students identified in the Kratz study was the teacher's ability to be patient as the students learn. According to Kratz, " Patience, always needed in training the young, received quite a high degree of appreciation" (p.

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416). Kratz's conclusion, the necessity of patience, could be seen as a precursor to the current teacher technique of wait time.

The data supports Kratz's hypothesis, that there are identifiable personality traits associated with the effective teacher. While Kratz's position of a sympathetic and cooperative classroom is a logical assertion the data collected is incomplete and does not support Kratz's claim, "...those [teacher] characteristics which impress the pupil favorably, which lead to a high appreciation on their part, and establish those relations of sympathy and cooperation which are essential in the school room, must have some value" (1894, p. 413).

Barr and Emans (1930), surveyed cities with populations of 25,000 or more persons in the United States, with a return rate of 46 states from the then 48 states. This survey resulted in the identification of 209 different rating scales. Barr and Emans used a four step methodology to classify the respondents' data items. The first step was classification of items that were identical. Those items were listed together and this first step accounted for 3989 of the 6939 items. That these differing rating scales, which used differing points of reference and philosophies, produced identical results which account for 58% of the total is a clear indication of agreement in the area of which characteristics are considered prerequisites to successful teaching. The next classification step was to use independent classification by three people, if the researchers agreed the item was assigned a certain classification. The third step was classification through a consensus or heuristic approach and the last step was the compilation of all the data into the completed table.

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Barr and Emans (1930) identified six primary characteristics of the successful teacher as seen from the perspective of the administrator, supervisor or teacher. In essence this survey revealed the perspective of the professional educator. In the survey the top qualities were identified as 1) instruction, 2) classroom management, 3) professional attitude, 4) choice of subject matter, 5) personal habits and 6) discipline.

The first characteristic, instruction, is considered the central quality necessary to be successful in teaching (Barr & Emans, 1930) . This characteristic is synonymous with the conclusion in the Kratz (1894) study that identified the teacher's ability to assist with the students' in their studies. These could be seen as two facets of the same item. Instruction as found in the Barr and Emans study were group activities of learning and the assistance with studies found in the Kratz study was identified by the individualized instruction the teacher utilized.

The next quality that was identified was the ability to manage a classroom. As Medley found in his 1977 review of the research, the effective teachers manage their classrooms with less effort and that the classrooms that were on task more often were also the classes that were less disruptive. The next characteristic, professional attitude, has also been linked to classroom management and to the ability to teach effectively (Medley, 1977).

The last three items in descending order of reported magnitude are related to the previously discussed items. Choice of subject matter is intricately inter-twined with the teachers' abilities and opportunities to teach. The item, personal habits, is a reflection of the teachers' professional attitude. If the teachers have high profession standards

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they will maintain the appropriate personal habits and the teachers will realize that the community sees itself reflected in their teachers. The last item, discipline, is a result of the teacher's other five qualities. If the students see their teachers as professional persons, who understands their subject matters and are in charge of the classrooms the incidence of discipline activities will decline.

There was a major deficiency in this study in that certain items were separated in distinct categories that should have been combined. This leads to a serious weakening of the research design and may have obscured certain strong qualities found in many teachers. One area that was neglected was the area of pupil achievement, by this study's classification the authors and co-investigators revealed their bias by dividing the pupil's achievement scores into 20 differing subsets. This was a reflection of this era's understanding of education, which was that the students were empty receptacles and the teacher was the source of all knowledge and understanding. If these subsets were recombined, the quality of pupil achievement becomes one of the primary qualities of an effective teacher with a reported incidence that is more than 50% higher than the instruction category. The next divided item was classroom management, which as a logical outcome should include discipline as an intricate part and not as a separate subset. This will result in classroom management being assigned an importance which would be slightly less than student achievement. Lastly the items instruction and choice of subject matter can logically be combined and this would result in classroom instruction being placed at the top of the required qualities of an effective teacher. When these considerations are involved in the classification process the result is three qualities, classroom instruction, pupil achievement and classroom arrangement, which

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account for approximately 20% of the total reported qualities. This assertion is supported by Medley in his 1977 study teacher competencies and teacher effectiveness, "Competence has to do with how a teacher teaches and is measured in terms of teacher's behavior; how effective a teacher is measured in terms of pupil learning" (p. 7).

Charters and Waples (1929) identified the characteristics of a successful teacher from the perspective of the teacher or administrator. This was another variation of the 'expert educator' description study. Charters and Waples identified seven areas of interest in the area of teacher activities. Charters' and Waples' teacher activities are synonymous with Medley's (1977) competencies. A competency is a teacher behavior that has been identified with teacher effectiveness and as such can be used to indirectly indicate a teacher's effectiveness (Medley, 1977). This is the same line of reasoning that Charters and Waples developed in their identification of the seven teacher's activities of the successful teacher. The first characteristic and the one given the most importance by Charters and Waples was, "teaching activities involved in classroom instruction" (pp. 304-345). This characteristic was divided into two major categories, teaching subject matter and teaching pupils how to study. The first category, teaching subject matter was further subdivided into ten competencies, which were 1) planning, 2) identifying objectives, 3) organizing the subject matter, 4) developing interest, 5) instructing, 6) assigning work, 7) providing practice time for pupils, 8) providing time for individual studies, 9) understanding the pupils' need, abilities and achievements and 10) exhibiting useful teaching traits. These competencies are recognized as desirable teacher traits and they are used in the evaluation instruments

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being utilized by Texas. The primary difference between this stage and the Medley's (1977) analysis of the usage of teacher competencies is that under Medley (1977) the identification of competencies is seen as the beginning of the process to identify the effectiveness teacher and not as a means in and of themselves.

The other six areas of competencies were divided by Charters and Waples (1929) into two major interests, which are co-curricular activities and professional interpersonal activities (pp. 346-472). The first area, co-curricular, is concerned with the teacher abilities to be involved in the management of the classroom and school and activities involving the pupils and other members of the public in non-educational settings such as, social, athletics and public meetings. The other area of interest was the ability of the teachers to interact with their co-workers on a professional basis. This area was further identified as activities concerning the professional advancement of the teacher, relationships between the teacher and other professional staff, and coordinating activities that were concerned with the school plant and school material. Underlying the search by Charters and Waples to ascertain the qualities of a successful teacher is the assertion that the teachers are responsible for the learning that occurs in the classroom. This assertion by Charters and Waples could be seen as an early forerunner of Total Quality Management (TQM) which was advocated by Deeming in 1984. The primary fault of the research by Charters & Waples was that they did not continue to the next logical step and involve the students in their learning processes.

Hart (1934) returned to the same source of information that Kratz had utilized in 1894. Hart directed the question of the research study toward the students. The primary question was, What are the characteristics of your most effective teacher as

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opposed to your favorite teacher? This research resulted in the identification of characteristics of the effective teacher as seen from the perspective of the high school student. This is a departure from the Kratz (1894) study that used students in the grades of 2-8 inclusive as the data base. The four characteristics identified by the students in the Hart study in order of importance are, 1) more demanding of the student, 2) more teaching ability, 3) more knowledgeable of the subject matter, and 4) better discipline. These items are analogous to the conclusions in the Kratz (1894), Barr and Emans (1930) and Charters and Waples (1929) studies. In all of these studies (Barr & Emans, 1930; Charter & Waples, 1929; Kratz, 1894) the characteristics of being a demanding, knowledgeable, pedagogically sound teacher, while being supportive of the students' emotional and social need was repeated from the perspectives of the students, teacher, supervisor and administrator. The descriptive statistics identified in the first stage was instrumental in developing an understanding of the personality traits and professional knowledge considered necessary for a person to be a successful teacher. The research did not identify any methodologies that could be instrumental in developing the traits of a successful teacher.

The next stage of research in teaching styles was primarily concerned with investigating the methodologies of teaching to ascertain which methodology was associated with the more effective teacher. This emphasis of the methodology research was to improve the teachers' abilities and the pupils' outcomes.

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Teaching Methodologies and Effective Teaching

The next stage of investigation was primarily concerned with the analysis of the potentialities of various teaching methodologies. The methodologies were predicated on the developing linear teaching model (Anderson, 1959). The linear teaching model has been identified with a plethora of continuum labels a few of these are authoritarian-democratic, teacher centered - learned centered, directive-nondirective, directive-permissive (Burnett, 1957; Burton, 1952; Cronbach, 1954; Wispe, 1951). All of these titles presuppose a linear model of teaching with one attribute on an extreme and its opposite on the other extreme. All of these linear models used the pupils' achievement as one of the criteria for determining teacher effectiveness, but the model did not recognize that the pupils were interactive participants in the learning process.

Corey (1940) was investigating the supposition that the nature of, "The questions the teacher and pupils ask and answer orally give insight into the progress of learning and into the types of learning that the teacher deems most important" (p. 745). In order to investigate the supposition, Cory hired an expert stenographer to make verbatim records of all the conversations in the classrooms over the course of six classes. Cory then asserts that, " The chief purpose of this analysis of a complete talk record was to get some evidence bearing on the growth of pupils in understanding" (p. 745). Cory was unable to develop the desired analysis because, "the pupils did not talk enough to give any evidence of mental development; the teachers talked two-thirds of the time" (p. 746). Corey found that the instructional method was based on recital and the data shows that the teachers' controlled the classrooms by the utilization of verbal commands for answers to questions and lecture. As such this type of instructional

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methodology could be identified as a direct teaching style dominated classroom. Further evidence of the conclusion is found in Corey's finding mentioned above "...that the teacher talked two-thirds of the time" (p. 746).

Corey (1940) ascertained that the teacher asked eleven times more questions than the students did in this study's setting and timeframe. This lead to a situation in which the students would be unlikely to respond adequately to their teacher's inquiry due to the limited time allotted for their answers. According to Cory, "The frequency with which the teachers asked questions (Table 2) is probably proof sufficient that no great number of 'thoughtful' answers were expected" (p. 750).

The primary defect in the descriptive design of the Corey study was that the students' achievement scores were not acquired nor considered. Nor was the correlation between the amount of teacher talk and student achievement calculated. This study is an example of the developing linear model, but without the secondary characteristic of integrating the pupils' achievement to ascertain teacher effectiveness.

Wispe (1951) found that there was not an overall difference in the students' achievement in the directive and permissive teaching styles classrooms. Wispe described the directive teacher section as a, "... material-centered and highly structured. The instructor defined the problem areas frequently, he asked many drill-type specific questions, and lectured at long length on course-related materials"(p. 168). Wispe also identified the permissive section as, "student-centered and activity-centered. The representative permissive instructor asked many wide-open and reflective-type question" (p. 168). These types of teaching styles were further classified as a type of teacher-centered or student-centered teaching style continuum (Anderson, 1959). The

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type of classes utilized in the Wispe study were introductory college courses on social relations. Wispe analyzed two independent variables, the first administration of pre-test and the SAT scores were compared to the dependent variables of the second administration of the pre-test, now the post-test, and the objective part of the final examination. The finding of the Wispe study was, " When analyzed in this way none of the F ratios were significant" (p. 170). Wispe then divided the students into high and low ability groups and he reanalyzed the objective part of the final. From this analysis Wispe was able to see, "that although teaching methods make no significant difference in the final examination scores of the brighter students, the scores on the objective-final of the poorer students were significantly raised by directive-type instruction" (p. 170).

Similar findings were found in operational replicates of the Wispe (1951) study. The type of teaching style was not significantly correlated to the students' outcome as it was measured by achievement (Haigh & Schmidt, 1956). Ostlund (1956) found that the lower ability or the lessor prepared student seemed to benefit from direct teaching.

The instrument Flanders (1960) developed was the Flanders Interaction Analysis Category (FIAC). This was one of the first attempts to quantify the operational definition of the terms direct and indirect teaching styles. Flanders asserted that teachers' teaching styles could be arranged on a continuum with indirect on one end and direct on the other end. He further contended that teaching style could be operationally defined by a set of characteristic verbal behaviors and that these behaviors could be manipulated into a ratio design. This lead to his identification of indirect teaching styles as the indirect value divided by the direct value and if that answer was greater that one then the teacher was identified as indirect; conversely if

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the number was under one the teacher was identified as direct. The indirect score is obtained by counting the frequency of occurrences in categories 1, 2, 3 and 4, the direct scores are obtained by counting the frequency of occurrences in categories 5, 6 and 7 in the FIAC (Flanders, 1964). Flanders used the FIAC in New Zealand and found that the indirect teaching style was associated with higher student scores in the two types of classes in the study, 7th grade social studies and 8th grade science classes (Flanders, 1965). This information is supportive of the conclusion that the indirect teaching style is more effective than the direct teaching style and that there is a linear relationship between teaching style and pupil outcomes.

This conclusion was contradicted partially by the findings in the Soar (1968) study and completely by the Bennett (1976) study. Soar (1968) found evidence of a curvilinear relationship between teaching styles and lower cognitive pupil outcomes. There was also evidence of a linear relationship between indirect teaching style and higher (synthesis) level cognition in the students. This modest correlation (exact statistic was not reported by Soar) was the interaction between indirect teachers and low anxious students, for any other type of student there was not a significant relationship between teaching style and student achievement (Soar, 1968). Soar utilized Flanders Interaction Analysis instrument to operationally define the terms direct and indirect teaching styles. Indirectness was defined as the factor score of the 3-3 and 4-4 cells (accepting ideas and asking questions) and the cell of rows and columns 1 through 3 (any sequence of accepting feelings, ideas or praise to the students) minus the sum of column 10 (silence and/or confusion) in a FIAC matrix. According to Soar,

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> What appears to be clear is that when the objective is the learning of concrete material such as spelling, the multiplication table, or foreign language vocabulary, the teacher should be quite direct and highly structured in his presentation; but when the objective is an abstract one, such as the concept of conservation in children, or new math, or creative writing on older pupils the teacher should be highly indirect. *The effective teacher must be able to shift style as he shifts objectives* [Italics added] (1968, P. 279).

The Rothman (1969) study was an investigation into the preparation of the teacher in his/her field and its correlation to the students' learning outcomes. Here the author identified student outcomes by cognitive and affective attributes. The findings in the cognitive realm of investigation were significant between the teacher's preparation and the pupils' cognitive outcomes. This relationship was found to be significant without regard to the type of teaching style utilized by the teacher. The primary importance of the Rothman study was the finding of the "c^2 approximation of Wilk's I for the test of the hypothesis of no overall relationship the teacher background and the students' learning variables..." (p. 342) was significant at $p < .10$ but, only eight of the thirty-five subscales were significant at $p < .10$. The students' Physics Aptitude Test (PAT) was significantly correlated at $p < .01$ to the teachers' number of semester hours of college physics. The students' scores on the Academic Interest Measure, Physical Science (AIM PS) were correlated with the teachers' semester hours of college level physics classes at the level of $p < .10$. The teachers' number of college math semester hours were significantly correlated at $p < .05$ with the students' scores on the Test On Understanding Science (TOUS) and the PAT. The teachers' number of math courses

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was also positively correlated with the students' AIM PS scores, at the p <.10 level. The teachers' scores on the Test of Selected Topics in Physics (TSTP) was negatively correlated with the students' feeling of "Physics: Interesting" at the level of p <.05 and the TSTP was positively correlated with the students' scores on the TOUS at the p <.10 level. Lastly the teachers' physics teaching experience was correlated to the students' PAT scores at the level of p< .05.

In the affective realm Rothman (1969) found the teachers' attitudes predicted changes in student attitudes as the highly significant level of p< .02. The relationship is positive and reflective, if the teacher projects the attitude physics is important and it is easy to learn students will project the same attitude toward physics. The teacher's projection of physics is understandable correlated to the students finding that physics is easy at the level of significance of p <.05.

Rothman (1969) concluded, "In general the results indicate that students acquire more knowledge about physics when taught by teachers with more extensive preparation in physics, physics education, and mathematics with greater knowledge of physics and longer physics teaching experience" (p. 347). This leads to the conclusion that two other variables which impact on teachers effectiveness would be the teachers' academic preparation in their field and their experience level in that particular subject. These factors will have to be controlled in order to clarify the interaction between teachers' teaching styles and the students' field independent or field dependent status.

Tuckman (1970) produced an instrument designed to assess the directness or indirectness of teaching styles. This instrument was a radical departure from the above approaches to assessing the teacher's style, in that the observers were the teacher's

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students and not outside professional observer(s) or outside professional educator(s).

The Tuckman (1970) study consisted of twenty-two eleventh and twelfth grade teachers from a vocational high school. One half of the teachers taught vocational subjects and the other half taught traditional academic courses. All of the teachers had at least five years teaching experience. This attribute would eliminate one of the identified confounding variables of the Rothman (1969) study, inexperienced versus experienced teachers. The reliability of the Students Perception of Teacher Style (SPOTS) was established by the usage of item analysis. The mean SPOTS score of each item was correlated with the grand mean SPOTS score of each teacher. Twenty-five of the thirty-two items were found to be highly significantly related and they were retained to form the final version of the SPOTS instrument. The inter-rater reliability ranged from an r of .98 for the first deviation to an r of .69 for the tenth deviation. This established that the instrument would produce approximately the same result without regard to the individual student conducting the assessment. This instrument developed the basis for a new operational definition of the variable direct and indirect teaching style. The nearer the teachers' scores are to the value of one the more indirect the teachers are in their teaching styles. Conversely the higher the score, the nearer to the maximum score of 9 a teacher is the more direct the teaching style.

The major deficiency of the SPOTS scale is that it is a linear model of one teacher trait, directness or indirectness of teaching style. Tuckman's (1970) study introduced the instrument, but Tuckman does not relate the teacher's teaching style to students' academic outcomes. This needs to be accomplished to ascertain if the

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teachers' teaching styles, as described by the SPOTS instrument, are predictive of the students' cognitive outcomes.

Bennett (1976) found that the formal teaching style was more effective at the lower cognitive levels, since the pupils taught under the formal style teacher outperformed their informally taught colleagues. Bennett identified these two types of teaching as 'formal' and 'informal' but their operational definition was synonymous with direct and indirect teaching. The students were pre and post tested in the areas of mathematics, reading and English. In the reading area Bennett found that the students' taught under a formal teaching style achieved .5 standard deviations above their predicted scores, which were determined by their pre-test. The mixed or intermediate teaching style resulted in a 1.0 standard deviation above their predicted scores. The students taught under the informal teaching style under performed by -1.5 standard deviations when compared to their predicted score.

In the area of mathematics, the students taught under the formal teaching style resulted in an achievement of 2.0 standard deviation above their predicted scores. The students that were taught under the informal and mixed achieved at -1.5 and -1.0 standard deviations respectively below their predicted scores.

In the area of English the results were similar, the formally taught students exceeded their predicted scores by 1.5 standard deviation. While the students taught under informal and mixed teaching styles under achieved by -1.2 and .-3 standard deviations below their predicted scores.

In the creative (synthesis) or higher cognitive realm there was no significant difference between the pupils achievement scores in the differing teaching groups and

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their intermediate, mixed teaching style. Bennett (1976) was an extensive study conducted into beneficial analysis of the two competing teaching methodologies, direct and indirect teaching and their intermediate, mixed teaching style. This was primarily true due to the large size of the initial sample size, 871 schools in north-west England, with thousands of students. According to Bennett, direct teaching is the act(s) of the teacher which restrict the students' freedom of movement or control of the selection and sequencing process of the instruction pattern or both. The operational definition of indirect teaching is the act(s) of the teacher which increases the students' freedom of movement and increases the students' control of the selection and sequencing process of the instructional pattern or both.

While Soar (1968), Bennett (1976), Tuckman (1970) and Flanders (1965) were conducting research on the linear model of teaching methodology only Flanders was concurrently working on the stability of the teachers' behavior. If the teacher's teaching behavior is not stable over a sufficient time frame then the linear model would not be able to explain the learning outcomes of the students (Brophy, 1973; Flanders, 1970).

In the Flanders (1970) study the researcher working with data from New Zealand and Minnesota developed evidence to support the hypothesis that, "once the teacher has established a pattern of direct or indirect teaching this pattern will be stable the following year with completely different students" (p. 223).

Brophy (1973) investigated the question, 'Are there any stable teacher behaviors?' The study used ordinary teachers in their classrooms without an experimental intervention. The teachers' behaviors were identified and then used to classify the teachers into categories. Brophy used the Metropolitan Achievement Test

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(MAT) to identify the students' achievement with the 1st grade as the baseline, and the scores from the 2nd, 3rd and 4th grades were used for comparative purposes. The students' achievement scores were used to indicate the teacher's effectiveness. The baseline score was then used as a covariate and from that point the other grade scores were converted to Grade Equivalent Levels (GEL) and the residual scores were calculated. Brophy found that the teacher's behaviors were stable across the three years this study was being conducted. There was a statistically significant association between grades 1 to 2, 1 to 3 and 2 to 3. These relationships were present without regard to the classroom status as a Title 1 classroom or a non-title 1 classroom. The Brophy (1973) and Flanders (1970) studies established that there were specific, identifiable teacher behaviors which were stable in the time frame of multiple school years.

Veldman and Brophy (1974) completed a study which operationally replicated the Brophy (1973) study. In this study the researchers investigated the predictive value of a series of variables on the criterion variable, pupil achievement. The selected predictor variables were; 1) gender, 2) pre-test, 3) teacher behaviors and 4) Socio-Economic Status (SES). The pupils' gender were found to be an extremely weak predictor although Veldman and Brophy observed that girls significantly outperformed the boys in both grade levels. The pre-test was the most powerful indicator of success with the teacher's behavior the second most powerful indicator of pupil success in the classroom. The pupil's SES status was found to be a moderating variable. Since the lower the pupils' SES, the more powerful the teacher's behavior is as a predictor of the pupils' academic success in the academic arena also they found it was found that the

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lower the SES the lower the cognitive and achievement levels. Veldman and Brophy also identified a flaw in the Rosenshine (1970) study which had found that there were not any stable teacher behaviors. Rosenshine's teacher sample included teachers which were in their first year of teaching and teachers which were in the first year of teaching a new grade level. Veldman and Brophy argue that the inclusion of these types of teachers into the Rosenshine study resulted in the skewing of the data and caused Rosenshine to erroneously conclude that teacher behaviors are inherently unstable. Veldman and Brophy found, "...that reasonable stable estimates of teacher influence can be obtained from standardized achievement measures to assertion that of pupil performance when the sample selection procedures eliminate new teachers and teacher who have recently switched grades. (1974, p. 323)

In the Good, T. L., Biddle, B. S. and Brophy, J. E. (1975) work, *Teacher's Make a Difference*, the authors advocated the usage of adjusted scores using a covariate as preferable to using the students' raw scores. The reasoning was that the raw scores were unreliable due to confounding variables. These raw scores would also be subject to the moderating variable of the amount of potential gain (A. Oliveraz, personal communication, June 1996). This moderating variable, amount of potential gain, occurs because the students who scored near the top end of the scale on the pre-test, do not have the same opportunity of achievement as a student who scored at the mean or less on the pre-test (A. Olivarez, personal communication, June 1996). This is supportive of the recommendation of Good, T. L. et al. (1975) to utilize the repeated measures design. According to Good, T. L. et al., "The usage of the repeated measures model

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will eliminate the problems of raw scores and gain scores, because the students' pre-tests will be used as a covariate" (p. 41).

Stallings (1976) was another attempt to determine which types of teaching methodology were more efficient, direct or indirect teaching. This paper was a follow through study of the 22 Follow Through educational programs; seven were identified for further study. Two of the seven programs were identified as following the direct teaching or positive reinforcement models and the other five programs were identified as indirect or open structure models. A total of 136 first grade and 137 third grade classrooms were observed in 36 different cities and towns. The comparison group, non-follow through classes, were identified and one class in each of 24 different locations was included in the study. Stallings found, "classroom instructional processes predicted as much or more of the outcome score variances than did entering school test scores of children (p. 47). From these findings Stallings developed the conclusion that, "...what occurs within the classroom does contribute to achievement in basic skills, good attendance and desired child behavior" (p. 47).

Stallings' findings in the area of comparative efficiency was a mixed set of results. In the areas of reading and math achievement, the students that were taught by teachers using the direct or positive reinforcement models scored significantly higher than all of the indirect or open structure models. The positive reinforcement model's students scores were also statistically significantly higher than the comparison groups' student scores. In the area of nonverbal problem solving the students that were taught under the open structure models scored significantly higher than the students that were instructed in the positive reinforcement models. These finding reinforce Soar's

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conclusion in his 1968 study in which he proposed that there was a curvilinear relationship between the lower levels of cognition and the indirectness or directness of the teacher's teaching style. Soar further proposed that the seemingly linear relationship between higher order learning and indirect teaching was because the teacher was not yet at the optimal indirect teaching level for the higher cognitive level.

Stallings reproduced the linear relationship between the higher cognitive levels and the teacher's indirect or open structure teaching style. Whether the relationship is in actuality curvilinear is still an unanswered hypothesis.

In Rosenshine's (1976) review of the research, he identified the characteristics of the direct teaching model. He said,

> In the direct instruction, the lessons and workbook activities are supervised by the teacher, and there is little free time or unsupervised desk work. The teacher is the dominant leader of the activities, decides what activities will take place, and directs without giving reasons. Teacher questions tend to be narrow, pupils are expected to know rather than to guess the answer, and the teacher immediately reinforces and answer as right or wrong. The learning is organized around questions posed by the teacher or materials provided by the teacher, and it is approached in a direct and business manner. (p. 365).

By inference the operational definition of indirect teaching is, the lessons and workbook activities are controlled or directed by the students, and there is a great amount of free time or unsupervised desk work. The teacher is not the dominant leader of the activities, s/he does not decide what activities will take place, and directs only after giving reasons for his/her decision. The teacher's questions tend to be broad, pupils

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are expected to try to find the answer, and the teacher does not immediately reinforce nor does the teacher identify an answer as right or wrong. The learning is organized around questions posed by the students, and is approached in an indirect and discovery oriented.

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Mastery-Deployment of Key Teaching Competencies and Teacher Effectiveness

Medley (1977), investigated the central question, "How does the behavior of effective teacher differ from that of ineffective teacher?" (p. 5). Medley reviewed 289 studies to ascertain the "relationship between how a teacher behaves and how much the pupils learn from him or her, commonly called *process-product relationship* (p. 5). [Medley's italics] Medley's basis for understanding the concept of teacher competencies is to utilize the measurement of teacher effectiveness as an indicator of teacher competence. According to Medley, "...we shall use the measure of effectiveness as an indicator of teacher competence, inferring that teachers who are effective are more competent on the average than teachers who are ineffective" (p. 6). Medley further distinguished between teacher competency and teacher effectiveness by identifying, "competence has to do with how a teacher teaches and is measured in terms of the teacher's behavior; how effective a teacher is is measured in terms of pupil learning" (pp. 6-7). This lead Medley to "...view the behavior of the teacher as an *effect* rather than a cause" [Medley's italics] (p. 7). This leads to the conclusion that a competency is a behavior which is strongly associated with teacher effectiveness (Medley, 1977).

The State of Texas as incorporated the idea of general teacher competencies into their evaluation rubric for their teaching professionals. These competencies are divided into five categories; 1) learner-centered knowledge, 2) learner-centered instruction, 3) equity in excellence for all learners, 4) learner-centered communication and 5) learner-centered professional development (Texas Education Agency, 1995). First, learner-centered knowledge, is predicated on the teachers being well-grounded in

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their subject matters and on the ability of the teachers to facilitate the learned' development of patterns of studying. Second, learner-centered instruction, is based on the teachers being able to manage their classrooms from the perspectives of the individual learners, groups of learners and physical material necessary for learning to occur. These first two competencies are reflective of the works of Kratz (1894), Charters and Waples (1929), Barr and Emans, (1930), Soar, (1968), Flanders (1970) and many others.

The next competency, equity in excellence for all learners, is a relatively new phenomenon grounded in the goal, that all students can learn. Predicated on this goal is the assertion that all students will be given the opportunity to learn and excel in the school system. The fourth competency is related to earlier research (see Barr & Emans; 1930; Charters & Waples, 1929) in the area of effective communication between the teachers, and the families, fellow professionals and the public. The reflective portion of this competency, "because the teacher is a compelling communicator, students begin to appreciate the important of expressing their views clearly" (TEA, 1995, p. 7) is itself reflective of the finding of Kratz (1894). Kratz found that, "... children are highly susceptible to such impressions of taste and neatness..." (p. 416) also he found that, "...pupils are generally more appreciative of the earnest and intelligent efforts of their teacher to training and develop them..." (p. 415). Both of these conclusions are supportive of the Texas Education Agency's utilization of learner-centered communication. The last competency, learner-centered professional development, the teachers are in the status of learners as they further develop the knowledge of their subject matters and various teaching methodologies.

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Interpersonal Teaching Styles and Pupils Achievement

In the mid-70's the emphasis on research into teacher effectiveness changed toward understanding the impact the teacher's interpersonal communication style on pupils achievement. At the same time the understanding that the student was an active participant in his/her learning was incorporated into the research model. The instrument (Tuckman, 1976), Tuckman Teacher Feedback Form (TTFF) was constructed using Kelly's (1955) Theory of Personal Constructs. Kelly's theory was not the proper theory to develop an interpersonal behavior instrument to evaluate the teachers' interpersonal teaching style (Wubbels, 1993).

The Burkman, Tate, Snyder and Beditz study (1981) was concerned with ascertaining how academic ability, time allowed to study and teacher directness affected student achievement in a high school science course. This study was conducted using the Individualized Science Instructional System (ISIS). This modality of science instruction was specifically developed for the terminal (non-college bound) high school student. The Burkman et al. study utilized six differing treatments to develop their data for their research. There were two types of teaching styles, these were direct and indirect. The indirect method consisted of the teacher setting the overall time limitations of the course and the presentation order of the learning modules under study. The student was held individually responsible for completion of the material; and the teacher would assist if the student requested his/her help. Other than the overall deadline there were not any intermediate timetables for completion of the material. The students were able to utilize retesting as an option if their end of module score was unsatisfactory. In the direct teaching area the teacher predetermined a daily work

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schedule for the students and the teacher held full class lectures and discussion sessions. There was no retesting allowed if the students did not obtain a satisfactory score on the end of module tests. The treatment was further affected by the second factor which was the amount of time allowed to study. There were three treatment groups in this area; low, medium and high. The result was a 2 X 3 research design.

The results of the Burkman et al. (1981) study were that in the lower cognitive levels the relationship between direct or indirect teaching and achievement was curviliner. Of the three characteristics under study, student ability accounted for more of the variance than the other factors. The high ability group gained the most with the direct teacher and did rather poorly with indirect teachers. This pattern repeated itself with the low ability group. In both groups the teacher-centered or direct teacher's students scored higher on the achievement test except for the group that was allowed the least amount of study time. The achievement test consisted of 58 multiple choice tests and was targeted toward the lower cognitive levels(Burkman, et al. 1981). This research is generally supportive of the earlier Soar research identification of a curvilinear relationship, but the Burkman et al. study developed evidence that the direct teaching style was most effective with higher ability students. These were the types of students that Soar (1968) identified as most effective under indirect teachers. The contradictions of results in similar research studies is indicative of the presence of other unidentified variables.

The Leary (1957) model was developed to describe and measure specific interpersonal behaviors, primarily in a therapeutic setting. The Leary model was developed to measure both normal and abnormal behavior on the same scale, and it

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therefore can be applied both inside and outside the clinic (Wubbels, Creton, Levy, & Hooymayers, 1993). The Leary model identifies personality as the controlling factor in interpersonal behavior. The premise of the Leary model is that people use communication to accomplish two goals. The first goal is to avoid anxiety and the second goal is to feel good about themselves. The model further recognized that different persons will use different methods to achieve the two goals. The methods available are as numerous as the human personality; a person could use dominance or submission to obtain his/her goals. Using the Leary model and Watzlawick's et al modifications as a template Wubbels, Creton, and Hooymayers (1985) developed the model for interpersonal teacher behavior. The term interactional teacher behavior, which is synonymous with the term interpersonal teacher behavior, was operationally defined as, "... behavior that refer to the relationship between the teacher and his students and which is expressed in the interaction between the personal communication in the classroom" (Wubbels et al. 1985, P. 3).

The Wubbel's et al. model for interpersonal teacher behavior directly adopted the two dimensional plane with 'Influence' on the vertical axis and 'Proximity' on the horizontal axis.

> The model maps interpersonal behavior with help of an influence-dimension (Dominance-Submission) and a proximity-dimension (Cooperation-Opposition). These dimensions are equally divided into eight sectors. Every instance of interactional teacher-behavior can be placed within the system of axes. The closer the instances of behavior are placed in the chart, the closer they resemble

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each other (and the more similar are their effects on the students). (Wubbels et al. 1985, P. 3)

See Wubbels, Creton, Levy, and Hooymayers (1993:16) for a pictorial presentation of the Interpersonal Teacher Behavior Model and its key descriptors. Also see Brekelmans, Levy and Rodriguez (1993:48,49) for pictorial presentations of the eight typologies of Teachers' Communication Styles. Teacher communication styles are the results of multiple samplings of a teacher's interpersonal teaching behavior.

This adaptation of the Leary (1957) model resulted in the eight sections, two in each quadrant in upper right; dominance-cooperation and cooperation-dominance, lower right; cooperation-submission and submission-cooperation and, lower left; submission-opposition and opposition-submission and the upper left; opposition-dominance and dominance-opposition. Each of these sections were identified by a specific teacher characteristic, these names are leadership, helping/friendly, understanding, student responsibility/freedom, uncertain, dissatisfied, admonishing and strict. Each of these sections had a number of items on the Questionnaire on Teacher Interaction (QTI) associated with it, "From the item scores, scale scores are constructed ranging from 0.0 to 1.0. The higher the score in a sector the more significantly or frequently the behavior of the sector is displayed" (Wubbels et al. 1985, P.5).

The Wubbels et al. (1985) model is not predicated on one teacher behavior as the only significant correlate with student achievement. Instead, the Wubbels et al. model recognized that the teacher behavior will consist of all of the characteristics mentioned above. The other interpersonal teacher behavior characteristic was identified by Brekelmans (1989) and that was the trait of stability. Except for the first

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few weeks of the school year a teacher's interpersonal teaching style is stable across years and classes. These findings led to the development of the Questionnaire of Teacher Interaction (QTI).

Several studies were conducted to ascertain the validity and reliability of the QTI. These studies were conducted in The Netherlands, in the USA and in Australia. As a result of these studies, Brekelmans (1989) calculated an item internal consistency of greater than .70 on the individual level and an item internal consistency of greater than .80 on the class level. A determination of the QTI's generalizability was calculated using Cronbach's alpha and by treating the students' responses as items with a result of .92 for 206 classes (Brekelmans, 1989). Since a value of .80 or higher is considered adequate for generalization purposes, the Wubbels et al. (1985) model of interpersonal teacher behavior is generalizable to the population. Brekelmans's (1989) research also ascertained that the two factors, influence and proximity, accounted for approximately 80% of the variance on all the scales. The QTI can be answered by the students in an evaluation of their teacher's behavior, or the QTI can be used by the teachers to self-report their behavior or identify their 'ideal' teaching behaviors. "Using this instrument, interactional teacher-behavior can be examined empirically. It is also suitable for giving feedback to teachers regarding their behavior" (Wubbels et al. 1985, P. 5).

The student's version of the model, the model for interpersonal student behavior, consisted of the same eight characteristics as the model for interpersonal teacher behavior and were further identified by a specific student behavior for each subscale in the instrument. These student behaviors are, leading group discussion, answering questions, listening to teacher, working independently, keeping a low profile, sulking,

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breaking rules and yelling, changing the rules. The reliability and validity studies conducted on the Questionnaire of Teacher Interactions, incorporated the student model of interpersonal behavior and it was also found to be valid and reliable, with excellent generalizability (Wubbels, Creton, Levy & Hooymayers, 1993). The QTI has also been validated as a feedback instrument to facilitate the improvement of a teacher's interpersonal teaching style. In the Wubbels et al. (1993) model,

> teachers are normally asked to select two classes which vary in age, learning ability, or some other characteristic in order to receive feedback from the widest range of student groups. Ironically, QTI scores from these two different types of classes do not very much, verifying the relative stability of teacher behavior. (p. 24)

In 1989, Wubbels and Levy conducted a comparative study of the Dutch version and the derived American version of the QTI. Both the Dutch and American version utilize students to measure aspects of the learning environment. The QTI was translated from the Dutch to the American language and as an added precaution, "the translation or the items was checked with a back-translation by an independent second translator (Wubbels & Levy, 1989, p. 4). The original American version contained one hundred items from the original seventy-seven items in the Dutch original version. This increase in items was caused by more than one possible translation from several Dutch items. The American version was then inspected by Wubbels and Levy to ascertain if it was still in accordance with the original Leary (1957) model. According to the Leary model, "an item should correlate highest with the scale to which it belongs and lowest with the opposite sector"(Wubbels and Levy, 1989, p. 4).

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Thirty three items were removed from the original one hundred American items because they did not correspond to the parameters of the assumptions of the Leary model. The second version was field tested and two more items were eliminated due to the same psychometric concerns. The final American instrument consisted of sixty-five items. Of these items fifty-nine were direct translations of their respective Dutch items. A series of item analyses were conducted to ascertain the American instrument's reliability. Seven of the eight section's reliabilities were above .90 and the other section's reliability was calculated to be .86. These values far exceed the minimal value of .60, that is the value that has historically been identified as the value at which the researcher does not attempt further improvement in the research instrument (Wubbels & Levy, 1989). These values also exceed the threshold for utilization in tests that will influence decisions about individuals (Wubbels & Levy, 1989). In a factor analysis the variation accounted for by the two factors, influence and proximity, was calculated to be 88.3% (Wubbels & Levy, 1989). From this data and analysis, "it can be concluded that the reliability of the American QTI is good and that there is some confirming evidence about the validity of the new instrument" (Wubbels and Levy, 1989, P.8).

Wubbels, Brekelmans, Creton and Hooymayers (1989) developed nine types of interpersonal teacher behavior patterns which were identified as 1) directive, 2) authoritative/friendly, 3) cooperative/tolerant, 4) repressive, 5) business-like, 6) uncertain/drudging, 7) aggressive/uncertain, 8) tolerant/uncertain and 9) friendly/tolerant. The reader can develop a clearer understanding of the implications of Wubbels et al. (1989) interpersonal teaching behavior model by studying these pictorial representations (see Appendix B) as well as the data tables.

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Brekelmans, Wubbels, and Creton (1990) utilized the Questionnaire of Teacher Interaction (QTI) to investigate the question, is there a correlation between student perception of teacher behavior and cognitive and affective outcomes, in the context of a physics curriculum? There were two types of physics curriculum, the traditional curriculum and the PLON curriculum. PLON is a Dutch acronym for, Dutch Physics Curriculum Development. The traditional curriculum was designed to suit those students that were going to need physics in their college studies. The content was reflective of a simplified and dated university physics course. The teacher did not emphasize the practical aspects of physics and the students were not required to conduct any laboratory exercises (Brekelmans, Wubbels and Creton, 1990). The newer curriculum PLON was developed to, "create curriculum materials that stimulate activity learning, reality learning and participation learning" (Brekelmans, et. al., 1990, P. 338).

The researchers' discovered that there was no significant difference between the two curricula when they evaluated the students' cognitive and affective learning outcomes. There was a significant difference found between the types of interpersonal teaching style subsets and both cognitive and affective learning outcomes. Cognitive outcomes were measured with a standardized and internationally developed test for physics subject matter. The researchers do not delineate the standardized test used in this research by cognitive nor affective levels of complexity. The test's validity was established by a high correlation between the teachers' in-class students' grades and the students' scores on the standardized physics test. "Further corroboration of the validity is obtained from the fact that the levels of the students abilities of the three

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school types are represented in the test scores (on a scale 0-100): MAVO 70, HAVO, 76, VWO 81" (Brekelmans et al. 1990, P. 339). The Dutch school system is stratified and the students' scored in these three types of schools should reflect this intellectual stratification. The scores that Brekelmans et al (1990) reported for the differing types of schools are indicative of the validity of the cognitive achievement instrument administered to the Dutch students in the three types of schools. The MAVO school type is the general secondary educational situation at the intermediate level. The HAVO school type is the general secondary education situation at the higher level and the WVO school type is secondary level education in preparation for university studies (Brekelmans, et. al., 1990).

The student's affective outcomes were ascertained by utilization of a questionnaire which targeted five areas of interest. These areas were represented by five scale: "appreciation of lessons, instructiveness, easiness, structuredness of lessons and subject matter and motivation for physics" (Brekelmans et al. 1990, p. 340-341). The affective instrument is still in the Dutch language and has not been translated using the procedures discussed earlier in the translation of the QTI.

In the cognitive domain, the teacher's interpersonal teaching behavior, for the section dominant-opposition was correlated to cognitive achievement at +.39, the higher the level of students' perceptions of teacher dominance the higher the students' cognitive outcome. The submission-opposition section was correlated to cognitive achievement at -.38, the higher the students" perceptions of the teachers submissiveness the lower the students' cognitive outcomes. Both of these correlations were significant at the $p < .05$ level. The other six teacher interpersonal teaching

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characteristics were not significantly correlated with student cognitive outcomes. The cognitive domain was not divided by cognition levels and the study does not address possible differences in significance and correlation as it pertains to the various cognition levels.

In the affective domain, the teacher's interpersonal teaching behavior was correlated with multiple affective outcomes. In the section dominant-cooperative, this type of interpersonal teaching behavior was positively correlated with appreciation of lessons (AP), instructiveness (IN), structuredness of lessons and subject matter (ST) and motivation for physics (MO). These correlations were significant at the $p < .05$ or less. In the section cooperation-dominant, this type of interpersonal teaching behavior was again positively correlated with appreciation of lessons (AP), Instructiveness (IN), structuredness of lessons and subject matter (ST) and motivation for physics (MO). These correlation were significant at $p = .05$ or less. In the section cooperation-submission, this type of interpersonal teaching behavior once again was positively correlated with appreciation of lessons (AP), instructiveness (IN), structuredness of lessons and subject matter (ST) and motivation for physics (MO). These correlations were significant at $p = .05$ or less. The next section submission-cooperation, exhibited a type of interpersonal teaching behavior that was positively correlated with only appreciation of lessons (AP), and easiness. These correlations were significant at the $p = .05$. The other three types of affective outcomes, Instructiveness (IN), structuredness of lessons and subject matter (ST) and motivation for physics (MO) were not significantly correlated toward a submissive-cooperative interpersonal teaching style. The section of interpersonal teaching style identified as submission-opposition was not

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significantly correlated to any of the students' affective outcomes. The sixth section under consideration, an opposition-submission interpersonal teaching behavior was negatively correlated with all the affective student outcomes. These correlations were significant at the p =.05 or less. The section identified as the opposition-dominant interpersonal teaching style was again negatively correlated with appreciation of lessons (AP), instructiveness (IN), structuredness of lessons and subject matter (ST). These correlations were significant at p =.05 or less. The last section dominant-opposition was negatively significantly correlated with easiness at p <.01, but all other student affective outcomes were not significantly correlated. These finding led to a general observation that a teacher's interpersonal behavior which falls to the right of the influence factor will be correlated with positive affective student outcomes. While the line of effectiveness for the cognitive realm is to the right of the axis with dominant-opposition on one end and cooperative-submissive on the other. Visually this is a rotation from the vertical orientation for positive affective student outcomes, to an orientation which is 45 degrees toward the left (See Appendix A). This leads to a dilemma for the teacher because the most effective areas of interpersonal teaching style are mildly contradictory. The way out of this dilemma might be found through the comparison of the teachers' ideal teacher and the students' best teacher. The interpersonal patterns on the two-way matrix are very similar. Perhaps, the students value the cognitive outcomes more than their affective outcomes.

This data from the Brekelmans et al. (1990) study leads to the conclusion that the teacher that projects leadership is positively correlated to positive cognitive outcomes. The dominant-cooperation (DC) section was also positively correlated to

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increases in four affective sets which are Appreciation of Lessons, Instructiveness, Structureness of Lessons and Subject Matter and Motivation. The other affective set was not significantly correlated. The other section related to DC the cooperation-dominant (CD) section was significant in all the same affective sets as was the DC section but, CD was found not to be significant with cognitive outcomes. The next quadrant , cooperation-submission (CS) and submission-cooperation (SC) were not significantly correlated with cognitive outcomes. The CS section was significantly correlated with the affective sets of AP, IN, ST and MO. The SC section was significantly correlated with the affective sets of AP and EA, all other pairs were insignificant. The next quadrant submission-opposition (SO) is negatively correlated with a negative cognitive outcome while the opposition-submission (OS) set was not significantly correlated to cognitive outcome. The SO set was not significantly correlated with any of the affective sets, while the OS significantly negatively correlated with all the affective sets. In the last quadrant, opposition-dominant (OD) was not significantly correlated with cognitive outcomes while the dominant-opposition (DO) set was positively correlated with cognitive outcomes. The OD section was significantly correlated with the affective sets of AP, IN and ST in a negative manner. The DO section was significantly correlated with only EA and that is a negative manner.

After closer examination of the results of the correlations of the teachers' interpersonal teaching behaviors and the cognitive and affective learning outcome, it is apparent that,

> if the teacher's aim is to promote both student achievement [Cognitive] and attitudes [Affective], they are pulled in opposite directions by the conflicting

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demands of the sectors DO and SC. In order to promote higher achievement, teachers have to be stricter but, to promote better attitudes, they have to be less strict (Wubbels et al. 1993, P.7).

This problem, the contradicting needs of the students, is identified in the literature but, a solution has not been offered. The literature of teaching styles research has traveled through four distinctive phases. The first phase was concerned with describing the characteristics of the effective teacher. The attributes were identified through survey research but, there was not any attempt to ascertain if these teacher qualities were correlated to student learning outcomes. The second phase was a series of investigations into the various methodologies of teaching. Once a methodology was identified, the researchers then used that data set and frame work to develop teacher methodologies. The research into the various methodologies of teaching led to the investigation of process-product processes. The utilization of process-product processes are evident in the development of the teacher assessment instruments, such as the Texas Teacher Assessment System (TTAS). Currently, researchers (Brekelmans, Creton, Fraser, Levy, Wubbels and others) are trying to identify interpersonal teaching styles of teachers and ascertain the styles' effects on student cognitive and affective outcomes. This area has been pioneered by the research of Professor Dr. Wubbels in The Netherlands, Dr. Levy in the USA and Dr. Fraser in Australia as well as their colleagues. This research has not investigated the effect of interpersonal teaching behavior and the students' cognitive outcomes at Bloom's six taxonomic levels of cognition. This is the area that this researcher proposes to investigate to ascertain the correlation(s) and the correlations' significance/practical

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effects between the students' QTI responses, their GEFT scores and their cognitive outcomes on end of sections tests.

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